

**REMARKS**

The Office action of October 12, 2004 has been received and its contents carefully noted.

Claims 1-2, 4-6, and 8-9 are pending in the application. Claims 1 and 5 have been amended and claim 9 has been added. Claims 4 and 8 have been deemed allowable.

Claims 1-2, and 5-6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Parulski et al. ("Parulski") (U.S. Patent No. 5,828,406) in view of Alston (U.S. Patent No. 4,541,010), Chang (U.S. Patent No. 5,264,939), and Watanabe (U.S. Patent No. 6,522,356). Applicants respectfully traverse these rejections, and requests allowance thereof for the following reasons.

**The Claims are Patentable Over the Cited References**

**Claims 1-2, and 5-6 are not made obvious by Parulski, Alston, Chang, and Watanabe**

Claims 1-2, and 5-6 stand rejected under § 103(a) in view of Parulski, Alston, Chang, and Watanabe. Further to the improper combination contended above, Parulski, Alston, Chang, and Watanabe, either alone or in combination, fail to disclose the features recited in these claims as amended such a plurality of photosensitive cells arranged bidimensionally in one-to-one correspondence to said color filters each for transforming light output from a

particular color filter to a corresponding signal charge, each of said plurality of photosensitive cells being shifted in position by half a pitch from adjoining ones of said photosensitive cells, and a plurality of vertical transfer paths, each one offset from each vertical column of said plurality of photosensitive cells, each comprising transfer elements arranged in a vertical direction for vertically transferring signal charges fed from adjoining ones of said plurality of photosensitive cells.

The combination of the cited references still fails to disclose the recited combination of the diagonal arrangement of R, B, and G photosensitive cells (half a pitch shift) together with vertical transfer paths offset from each vertical column of cells.

Particularly, Parulski discloses an electronic camera having a sensor 20 which includes vertical registers 68 offset from the plurality of photosites 66 (see FIG. 3A), but as admitted in the Action, does not teach nor suggest the diagonal arrangement of photosensitive cells. Also, Watanabe describes a diagonal arrangement of photosensitive cells (see FIG. 7), but uses a direct video signal line connection 3 between cells 1 (no offset) to provide a vertical transfer path.

Indeed, the newly cited Watanabe refers to CCDs merely as its general background. However, Watanabe fails to disclose CCD structure specifically including charge transfer paths. Watanabe instead teaches imaging apparatus

adopted to address photosensitive cells on an X-Y coordinate. Watanabe states, “the case of using an X-Y scan reading type apparatus as a two-dimensional solid-state imaging in place of a CCD.” *Emphasis added; See Watanabe, column 2, lines 31-33; Figure 7.*

Watanabe is silent regarding the structure of a CCD type of imaging device. The X-Y address type of imaging device taught by Watanabe does not include the vertical transfer paths as recited in the claims.

Thus, the combination of Parulski and Watanabe either provides a diagonal arrangement of cells with no vertical transfer path offset, or a vertical transfer path offset with no diagonal arrangement in strong contrast to the recited feature of both a diagonal arrangement of cells together with a vertical transfer path offset. The Parulski sensor 20 cannot be modified to have a diagonal arrangement of cells since it would render the sensor inoperable as this reference expressly and exclusively uses a square-lattice structure.

Similarly, both Chang and Alston disclose a square-lattice structure for the photosensitive cells and therefore cannot be modified to use a diagonal arrangement of cells.

Further, no references discloses the recited feature of a plurality of signal reading circuits, one for each one of said plurality of photosensitive cells, for shifting the signal charges from said plurality of photosensitive cells to said

plurality of vertical transfer paths, offset from said plurality of photosensitive cells.

Particularly, Parulski discloses sensor drivers 30 (see FIG. 2), but makes no mention of there being a sensor driver for each one of the photosensitive cells in contrast to the recited feature. Similarly, Watanabe only discloses a vertical driver line 2 (see FIG. 7) for each row of cells in contrast to the recited feature a signal reading circuit for each one of the plurality of cells. Further, Chang and Alston do not disclose this feature.

Thus, the cited references, either alone or in combination, fail to disclose the above-mentioned recited features making the claimed invention non-obvious and patentably distinct.

### **CONCLUSION**

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance. Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact Hyung Sohn (Reg. No. 44,346), to conduct an interview in an effort to expedite prosecution in connection with the present application.

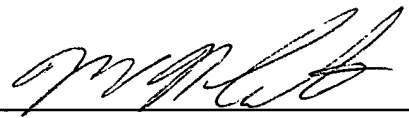
**Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) respectfully petition(s) for a one (1) month extension of time for filing a reply in**

**connection with the present application, and the required fee is attached hereto.**

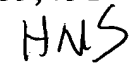
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH &, BIRCH, LLP

By:   
Michael R. Cammarata  
Reg. No. 39,491

MRC/HNS/jm

  
P.O. Box 747  
Falls Church, VA 22040-0747  
(703) 205-8000